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**BEFORE THE BOARD OF PATENT APPEALS  
AND INTERFERENCES**

Application Number: 10/030,870  
Filing Date: October 19, 2001  
Appellant(s): BOESNECKER, ROBERT

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Donald J. Daley  
For Appellant

**EXAMINER'S ANSWER**

This is in response to the appeal brief filed 4/28/08 appealing from the Office action  
mailed 5/14/07.

**(1) Real Party in Interest**

A statement identifying by name the real party in interest is contained in the brief.

**(2) Related Appeals and Interferences**

The examiner is not aware of any related appeals, interferences, or judicial proceedings which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

**(3) Status of Claims**

The statement of the status of claims contained in the brief is correct.

**(4) Status of Amendments After Final**

No amendment after final has been filed.

The appellant's statement of the status of amendments contained in the brief is correct.

**(5) Summary of Claimed Subject Matter**

The summary of claimed subject matter contained in the brief is correct.

**(6) Grounds of Rejection to be Reviewed on Appeal**

The appellant's statement of the grounds of rejection to be reviewed on appeal is correct.

**(7) Claims Appendix**

The copy of the appealed claims contained in the Appendix to the brief is correct.

**(8) Evidence Relied Upon**

EP 0567061 to Makivirta et al.

U31 to Aima et al.

GB 2265519 to Smith

**(9) Grounds of Rejection**

The following ground(s) of rejection are applicable to the appealed claims:

**Claims 1-6,8,10 and 14** are rejected under 35 U.S.C. 103(a) as being unpatentable over Makivirta et al. (EP 0567 061) in view of Azima et al. (US Patent 6,198,831).

Regarding **claim 1**, Makivirta discloses a method for operation of a loudspeaker, comprising:

measuring the acoustic frequency response of the loudspeaker (64, filter/correlator, column 5, lines 25-26).

determining a frequency curve based on the measured acoustic frequency response (4, wideband filter, column 5, lines 16-);

determining an inverse frequency curve to the frequency curve (column 1, lines 50-55; column 5, lines 16-26);

simulating the inverse frequency curve in a filter device as a transfer function of the filter device (column 5, lines 16-26);

and in an operating mode, compensating for the frequency response of the loudspeaker by the filter device, which is connected between the sound source and the loudspeaker based upon the transfer function (Figure 2B; column 3, lines 15-24)).

Makivirta discloses that the speaker is a one-way loudspeaker but fails to disclose that the loudspeaker is a flat panel loudspeaker.

Azima discloses a one-way loudspeaker, a flat-panel loudspeaker, in which at least one oscillating coil (9 transducer) is mounted on a surface in the form of a plate (sound radiating panel) having predetermined characteristics (Figure 3, inherent that the plate has some predetermined characteristics), comprising: stimulating at least one coil to oscillate electrically by a sound source (column 5, lines 15-17) and emitting sound by the surface stimulated to oscillate mechanically by the oscillating coil.

It would have been obvious to modify Makivirta's method of correcting by using a flat panel loudspeaker as the one-way loudspeaker in order to produce a more superior output over that of a conventional speaker (Azima, column 4, lines 61-62).

Regarding **claim 4**, Makivirta discloses a loudspeaker and a filter device for the sound signals, connected upstream of the at least one oscillation coil, wherein a transfer function of the filter device is the inverse of a frequency response of the loudspeaker ((column 5, lines 16-26; Figure 2B; column 3, lines 15-24)).

Makivirta discloses that the speaker is a one-way loudspeaker but fails to disclose that the loudspeaker is a flat panel loudspeaker.

Azima discloses a one-way loudspeaker, a flat-panel loudspeaker, in which at least one oscillating coil (9 transducer) is mounted on a surface in the form of a plate (sound radiating panel) having predetermined characteristics (Figure 3, inherent that the plate has some predetermined characteristics), comprising: stimulating at least one coil

to oscillate electrically by a sound source (column 5, lines 15-17) and emitting sound by the surface stimulated to oscillate mechanically by the oscillating coil.

It would have been obvious to modify Makivirta's method of correcting by using a flat panel loudspeaker as the one-way loudspeaker in order to produce a more superior output over that of a conventional speaker (Azima, column 4, lines 61-62).

Regarding **claims 2 and 5**, Makivirta as modified by Azima discloses wherein digital filters stimulate the transfer function of the filter device and wherein the filter device is in the form of a digital filter. Makivirta's apparatus is to be implemented with FIR filter (column 4, lines 50-53). This implies that any filter processing that is done is digital.

**Regarding claim 3**, Makivirta as modified by Azima discloses wherein the transfer function is formed by FIR (finite impulse response) filters, whose filter coefficients are derived from the inverse frequency curve (Makivirta, column 5, lines 20-25). It is implicit that the coefficients are derived as claimed. All elements of claim 3 are comprehended by the rejection of claim 2.

All elements of **claim 6** are comprehended by the rejection of claim 5.

Regarding **claims 8 and 10**, Makivirta as modified by Azima discloses a filter that is equipped with a digital signal processor (Makivirta, column 5, lines 15-25, filter 4). All elements of claims 8 and 10 are comprehended by the rejection of claims 6 and 6 respectively.

**Claims 7,9,11 and 12** are rejected under 35 U.S.C. 103(a) as being unpatentable over Makivirta et al. (EP 0567 061) as applied to claim 4 above and Azima et al. (US Patent 6,198,831) as applied to claim 4 above in view of Smith (GB 2 265 519 A).

Regarding **claims 7 and 9**, Makivirta as modified by Azima fails to disclose that the filter device includes a sample and hold element connected via an analogue-to-digital converter to the digital filter, whose output is connected to a digital-to-analogue converter. Smith teaches of compensating for the non-linear responses of a flat panel loudspeaker including a D/A and an A/D converter connected to a filtering means (digital format converter, Figure 5), a re-linearising device (Figures 5 and 6) and a memory (sample and hold element) connected as claimed (page 4, lines 8—19). It would have been obvious to modify Makivirta as modified by having the filter include a sample and hold element in order to re-scale the input signal in order to a displacement which is proportional to the input signal.

Regarding **claims 11 and 12**, Makivirta as modified by Azima discloses a filter that is equipped with a digital signal processor (Makivirta, column 5, lines 15-25, filter 4). All elements of claims 11 and 12 are comprehended by the rejection of claims 7 and 9 respectively.

#### **(10) Response to Argument**

**Applicant's Argument A- Changing the designation of references does not make-up for lack of reason to combine.**

*The Examiner argues that the Pre-Appeal Conference Decision (dated August 8, 2006) states only that the previous rejection in view of Azima and Makivirta, and that it was the*

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*suggestion of the Pre-Appeal Brief Review Conference Attendees that the Examiner use the same references, but reverse the order.<sup>36</sup> As argued during prosecution, however, a mere reversal in the designation of the references still does not make up for the lack of reason to combine.*

*Even in the previous rejection, a person having ordinary skill in the relevant art (herein "PHOSITA") would consider both disclosures in their entirety, regardless of which was considered by the Examiner as the primary reference. As Appellant has previously and persuasively shown (and the Pre-Appeal Brief Review Board agreed), a PHOSITA would not have had sufficient reason to combine Makivirta and Azima to arrive at the method of claim 1, for example; regardless of which reference is designated as the primary reference and which is designated as the secondary reference.*

#### **Examiner's response to Argument A**

In response to applicant's argument that there is no suggestion to combine the references, the examiner recognizes that obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. See *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988) and *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992). In this case, prior art Makivirta discloses a method for operation for a loudspeaker. The loudspeaker is a one-way loudspeaker. Makivirta only failed to teach of a flat panel loudspeaker. A flat panel loudspeaker is a type of one-way loudspeaker. The motivation to combine, as noted in the rejection set forth in the previous office action, was found in Azima. Azima teaches that a flat panel loudspeaker produces a more superior output over that of a conventional speaker (Azima; column 4, lines 61-62).

**Applicant's Argument B- Even if combined, Azima and Makivirta fail to render claim 1 obvious.**



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*1. The Examiner relies upon Azima to teach more than merely a fiat panel speaker. The Examiner further argues that, "[Azima] was cited only for disclosing a fiat panel loudspeaker."38 This is not the case. The Examiner relies upon filter/correlator 64 and column 5, lines 25-26 to allegedly teach the "measuring," step of claim 1.39 The filter/correlator 64 is not found only in Azima, not Makivirta. Consequently, the Examiner's allegation that Azima is relied upon to teach a fiat panel speaker is incorrect. Azima is further relied upon to teach the "measuring," step of claim 1. As will be discussed in more detail below, even in combination, Azima and Makivirta does not teach or suggest any such step.*

*2. Even if combined, Azima and Makivirta fail to teach or suggest all features of claim 1. While Azima arguably discloses measuring signal correction, the measured signal correction is applied only to the microphone use of the panel not loudspeaker use. Azima is silent about the details of the correction method performed by the filter/correlator (64) driven by a vibration transducer (63) during loudspeaker use of the panel (2). Moreover, even if details of the signal correction method were disclosed, Azima fails to teach how a signal is corrected and how that correction is applied to the input signal of the panel (2) when used as a loudspeaker. Therefore, Azima fails to teach or suggest, "emitting sound by the surface stimulated to oscillate mechanically by the oscillating coil," and "measuring the acoustic frequency response of this fiat surface loudspeaker," as required by claim 1.*

*Turning to the teachings of Makivirta, although Makivirta implies that a frequency response is measured, Makivirta fails to teach or fairly suggest that such a frequency response is measured from a sound emitted from the fiat panel loud speaker. Therefore, Makivirta also fails to teach or suggest "emitting sound by the surface stimulated to oscillate mechanically by the oscillating coil," and "measuring the acoustic frequency response of this fiat surface loudspeaker," as required by claim 1. Because neither reference teaches or suggests the above recited feature of claim 1, the combination of references does not render claim 1 obvious.4]*

### **Examiner's Response to Argument B**

. The applicants pointed out in his previous response that the examiner's citation of filter/correlator 64, column lines 25-26 of Makivirta for the measuring step was erroneous because the filter element 64 does not belong to prior art Makivirta. The examiner asserts that the inclusion of the filter/correlator 64 of Azima was a typo error. It was Column 5, lines 20-26 of Makivirta that was intended to be cited to teach the

measuring step, col. 5 lines 20-26 clearly states that " The wideband filter 4 according to the invention, covering substantially the desired audio range and being a digital filter, can be implemented in a digital signal processor 4b programmed to implement a desired transfer function, i.e. frequency response 2 which is the inverse of the frequency response of the loudspeaker..".

Therefore, Makivirta teaches of measuring the acoustic frequency response of the loudspeaker.

The applicant asserts that even if the citation of the filter/correlator were accurate that Makivirta as modified by Azima would still fail to teach or suggest, "emitting sound by the surface stimulated to oscillate mechanically by the oscillating coil," and "measuring the acoustic frequency response of this fiat surface loudspeaker," as required by claim 1.

Makivirta teaches of a one-way loudspeaker. Makivirta does not disclose that the one-way loudspeaker is a flat panel loudspeaker or of emitting sound by the surface stimulated to oscillate mechanically by the oscillating coil. Azima is cited as disclosing a one-way loudspeaker, a flat-panel loudspeaker, in which at least one oscillating coil (9 transducer) is mounted on a surface in the form of a plate (sound radiating panel) having predetermined characteristics (Figure 3, inherent that the plate has some predetermined characteristics), comprising: stimulating at least one coil to oscillate electrically by a sound source (column 5, lines 15-17) and emitting sound by the surface stimulata4ed to oscillate mechanically by the oscillating coil. Azima, column 5, lines 15-17 teach that " The panel is driven to resonate and produce an acoustic output by a

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transducer of the kind described above with reference to our co-pending application

Ser. No. 09/011773, 09/011770 and 09/011831." The examiner asserts that it is well known in the art that flat panel loudspeakers emit sound in the manner claimed.

Therefore, Makivirta as modified by Azima teach all of the features of claim 1.

**Applicant's Argument C- A person having ordinary skill in the art (phosita) would have no reason to combine and would have been lead away from the examiner's alleged combination.**

**1. A PHOSITA would not have sufficient reason to believe that combining Azima and Makivirta would produce a superior output.**

As previously argued during prosecution, in Makivirta, an FIR filter is designed such that the response is an inverse of the amplitude response of the loudspeaker system between selected frequencies. The wideband filter (4) is implemented in a digital signal processor programmed to implement a desired transfer function. The wideband filter (4) substantially covers the desired audio range and is a digital filter. Concisely, Makivirta refers to a sound reproduction system with a conventional membrane-type loudspeaker (i.e., sound radiating from a point-like sound source).

41 Again, this statement is made assuming arguendo such a companion could be made, which Appellant does not admit.

The conventional membrane-type loudspeaker is arranged in a loudspeaker cabinet such as the housing of a TV set. In this type of sound reproduction system, sound is corrected because the audio output of conventional membrane-loudspeakers is heavily influenced by its installation in a housing, for example, a cabinet, housing of a TV set or a housing of a mobile telephone.

Azima discloses a panel form combination loudspeaker/microphone for use in an interactive environment. The loudspeaker/microphone combination comprises a rectangular frame carrying a resilient suspension around its inner periphery supporting a distributed mode sound radiating panel. As shown in FIGS. 3 and 4 of Azima, a transducer (9) is mounted only and exclusively on (or in) the panel (9) at a predetermined location. The position of the predetermined location is calculated such that bending waves are launched into the panel (2). The bending waves cause the panel (2) to resonate and radiate an acoustic output.

Still referring to Azima, for use as a sound receiver or microphone the panel (2) includes a pair of vibration transducers (63) coupled in parallel. The pair of vibration transducers (63) drive a signal receiver and conditioner (65) connected to an output. Another vibration transducer (63) on the panel (2) is coupled to drive a filter/correlator (64). The output of the filter/correlator (64) is fed to the signal receiver and conditioner (65) for signal correction. In determining that claim 1 would have been obvious at the time of

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*the invention, the Examiner essentially argues one a PHOSITA would modify Makivirta's speaker to be a fiat panel speaker because doing so would produce a superior speaker. As one can appreciate, however, the speakers in Makivirta and Azima are two distinctly different types of speakers. Therefore, a PHOSITA would not expect that modifying Makivirta to apply to a completely different speaker (i.e., the fiat panel speaker of Azima) would produce a superior speaker. For this reason, a PHOSITA would have no plausible reason to combine Makivirta and Azima to arrive at the claimed invention.*

*2. A PHOSITA would not have combined Azima and Makivirta because Azima teaches away from doing so.*

*Furthermore, assuming arguendo a PHOSITA would have looked to Azima for the deficiencies of Makivirta, he/she would have been lead away from the present invention: Azima teaches to optimize the acoustic output by placing a transducer (9) on or in a panel at a predetermined location. Accordingly, when analyzing Azima a PHOSITA would recognize that acoustic output of a fiat panel speaker is optimized based on where the transducer (9) is placed.*

*Moreover, according to Azima, sound-output is best if the position of the transducer (9) is calculated as described in U.S. patent applications with serial nos. 09/011,773, 09/011,770 and 09/011,831. Thus, a PHOSITA would be lead to the teachings of these applications to optimize the acoustic output of a fiat panel speaker, and away from Appellant's invention.*

*Furthermore, Azima mentions signal correction in connection with the microphone use of the panel, but not for the loudspeaker use of the panel. Thus, while a PHOSITA may arguably be directed to utilizing signal correction in microphone use of the panel, a PHOSITA would also recognize the distinct differences between microphone use and loudspeaker use of a panel (e.g., input rather than output). These differences in mind, a PHOSITA would not be lead to believe that combining Makivirta and Azima would provide superior acoustic output of a fiat panel loudspeaker, as the Examiner would have Appellant believe.*

*3. The Examiner has failed to provide the requisite rational explanation to support the obviousness rejection of claim 1.*

### **Examiner's Response to Argument C**

The applicant essentially asserts under #1 that since Makivirta and Azima teach of different types of speakers that one of ordinary skill in the art would not expect that modifying Makivirta to apply to a completely different speaker (i.e. the fiat panel speaker of Azima) would produce a superior speaker. Therefore, there would have been no

reason to combine. The examiner asserts that Makivirta teaches of a one-way speaker and that the method and system can be applied to various sound reproduction systems (column 6, lines 30-42). . Azima teaches of a flat panel loudspeaker, which is a type of one-way speaker. The benefits of flat panel speakers are that they produce a better sound. One of ordinary skill in the art would have been able to apply Makivirta's method to a flat panel speaker and expect to produce a better sound.

Regarding #2, the examiner asserts that Azima does not teach away from combining Makivirta and Azima. The fact that Azima teaches of optimizing the acoustic output by placing a transducer on or in a panel at a predetermined location and that Azima mentions signal correction only in connection with the microphone use of the panel but not in connection to the loudspeaker use of the panel does not teach away from Makivirta. Makivirta was cited as disclosing frequency compensation for the loudspeaker. Makivirta teaches every feature of claim 1 except that the one-way loudspeaker is a flat panel loudspeaker or of emitting sound by the surface stimulated to oscillate mechanically by the oscillating coil. Azima is cited as disclosing these features. Azima, column 5, lines 15-17 teach that " The panel is driven to resonate and produce an acoustic output by a transducer of the kind described above with reference to our co-pending application Ser. No. 09/011773, 09/011770 and 09/011831." The examiner asserts that it is well known in the art that flat panel loudspeakers emit sound in the manner claimed. The benefits of flat panel speakers are that they produce a better sound. One of ordinary skill in the art would have been able to apply Makivirta's method to a flat panel speaker and expect to produce a better sound.

Regarding # 3, the applicant essentially asserts that the examiner has failed to provide a rational explanation to support the obviousness rejection under 103. The applicant goes through each rationale on pages 16-25. The examiner asserts that the rationale used was some teaching, suggestion or motivation in the prior art that would have led one of ordinary skill to modify the prior art references or to combine prior art teachings to arrive at the claimed invention. Makivirta was cited as disclosing frequency compensation for the loudspeaker. Makivirta teaches every feature of claim 1 except that the one-way loudspeaker is a flat panel loudspeaker or of emitting sound by the surface stimulated to oscillate mechanically by the oscillating coil. Azima is cited as disclosing these features. The rationale for combining was found in Azima, as noted in the previous office action, Azima, column 4, lines 61-62. The examiner asserts that it is well known in the art that flat panel loudspeakers emit sound in the manner claimed. The benefits of flat panel speakers are that they produce a better sound. One of ordinary skill in the art would have been able to apply Makivirta's method to a flat panel speaker and expect to produce a better sound.

#### **(11) Related Proceeding(s) Appendix**

No decision rendered by a court or the Board is identified by the examiner in the Related Appeals and Interferences section of this examiner's answer.

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For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

/Devona E. Faulk /

Conferees:

/Vivian Chin/

Supervisory Patent Examiner, Art Unit 2615

/Curtis Kuntz/

Supervisory Patent Examiner, Art Unit 2614